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TRAUMATIC BRAIN INJURY: SAME OR DIFFERENT

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DISCLOSURES

- Nothing to disclose

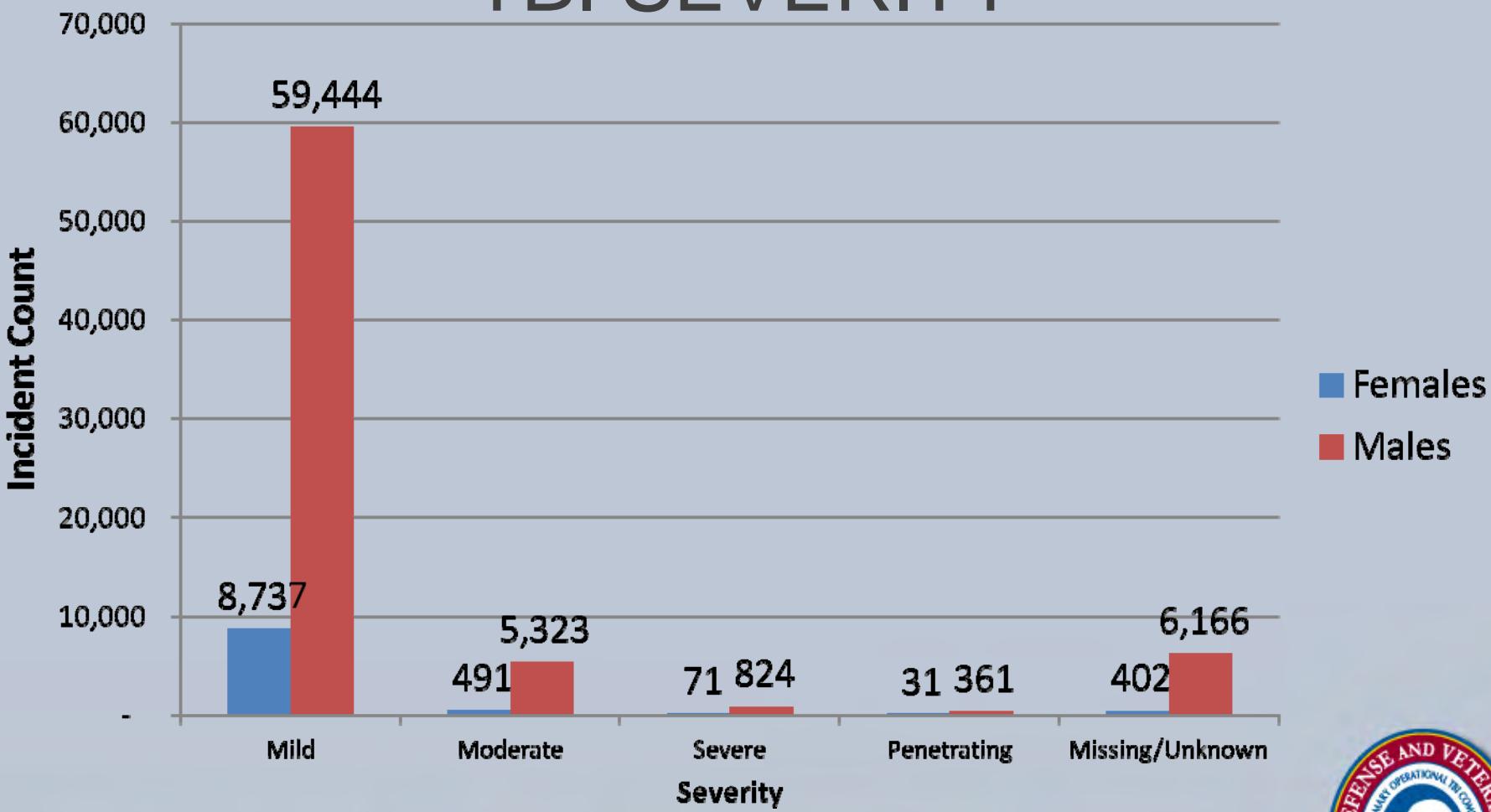
TRAUMATIC BRAIN INJURY



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POPULATION DESCRIPTIVE TBI SEVERITY



- Blast versus blunt TBI
- Male versus female



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BLUNT VERSUS BLAST TBI

	Blunt TBI	Blast TBI
Headache (Lew et al., 2006)	Tension-type	Migraine-like
Dizziness (Hoffer et al., 2009)	Vestibular-ocular reflex - normal to high frequency lag times Normal motor control testing	Vestibular-ocular reflex - low frequency lag times Increased latency on motor control testing
Hearing Loss (Lew et al., 2007)	Pure sensorineural (47%) Conductive (11%)	Pure sensorineural (58%) Conductive (8%) Mixed (19%)
Visual complaints (Goodrich et al., 2007)	Blunt polytrauma (20%)	Blast injury (52%)



COMBAT-RELATED TBI

- Symptom-reporting (3 or more symptoms)
 - » Initial 33.4%
 - » Post-deployment 7.5%
- Most common initial symptoms
 - » Headache
 - » Dizziness
- Most common persistent symptoms
 - » Irritability
 - » Memory problems

Terrio et al., 2009



SYMPTOM REPORTING

➤ Initial

- » Somatic complaints

➤ Persistent

- » Psychological
- » Behavioral
- » Social

DVBIC Care Coordination Program- unpublished data



GENDER DIFFERENCES

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MORTALITY

- No difference in mortality between men and women (Yeung et al., 2011)
- Peri/post menopausal women with lower risk for mortality and morbidity
 - » Pre-menopausal women no different than men (Berry et al., 2009)



MORTALITY

- Females, especially ≥ 55 years of age have higher mortality after isolated severe TBI (Dischinger et al., 2009)



MORBIDITY

- Women at increased risk for developing Heterotopic Ossification following TBI (Simonsen et al., 2007)



SEVERE TBI

- Brain tissue oxygenation (PbO^2)
 - » Transfusion of PRBCs has greater effect on PbO^2 in women (Arellano-Orden et al., 2011)



OUTCOMES

- Moderate/Severe (Arellano-Orden et al., 2011)

Males	Females
Restlessness	Headache
Sleep Disturbances	Dizziness
Difficulty with Goal Setting	Loss of Confidence
Phonophobia	Lack of Initiative



OUTCOMES

- Meta-analysis
 - » Functional outcomes similar (Ottuchian et al., 2008)
- Women have better outcomes than men (Slewa-Younan et al., 2008)
 - » Shorter length of stay
 - » Improved Glasgow Outcome Score
 - » Study excluded pre-existing psychological or substance use disorders



NEUROENDOCRINE DYSFUNCTION

- Male
 - » Testosterone suppression
- Females
 - » Estrogen suppression
- Generally transient abnormalities

(Wagener et al., 2010)



COGNITION

- Similar cognitive outcomes between genders
 - » Exception: visual memory may be better in women (Moore et al., 2010)
- Men at higher risk for developing dementia after TBI (2 meta-analysis) (Starkstein & Jorge, 2005)



REHABILITATION

- Geriatric study demonstrated that women have:
 - » Shorter lengths of stay
 - » Increased use of home health services

(Graham et al., 2010)



SYMPTOM REPORTING

- Adult females with increased reporting of post-concussive symptoms
- Minor females similar reporting to that of males
- No discrimination by sport or safety apparatus utilized

(Preiss-Farzanegan et al., 2009)



PSYCHOLOGICAL SYMPTOMS

- Acutely women report higher levels of
 - » Depressive symptoms
 - » Chronic stress
 - » Pain
 - » Memory problems
- No longer evident at 6-12 month follow-up

(Bay et al., 2009)



POST-CONCUSSIVE SYNDROME

- Higher prevalence in women
 - » 17% vs 6% (Spinos et al., 2010)
- Gender is predictive of post-concussive syndrome
 - » Female > male (Dischinger et al., 2009)



CONCLUSION

- Studies regarding gender differences have variable results
 - » Selection bias
 - » Sample size
 - » Injury severity
- Scientifically rigorous studies are needed



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